

We claim:

1. A process for reducing the content of oxygen-containing and/or nitrogen-containing compounds in streams having an isobutene content of at least 10% by weight, which comprises passing the stream in the liquid state at a temperature T [in K] and a linear velocity v [in cm/min] over a fixed bed of an acid-free zeolite having a mean pore size of from 0.3 to 1.5 nm, where the fixed bed has a length l [in cm] in the flow direction of the stream and T, v and l obey the relationship
$$2^{(T-283\text{ K})/10\text{ K}} \cdot l/v \leq 500\text{ min.}$$
2. A process as claimed in claim 1, wherein T is in the range from -30 to 30°C.
3. A process as claimed in claim 1 or 2, wherein v is in the range from 0.5 to 35 cm/min.
4. A process as claimed in any of the preceding claims, wherein the stream further comprises hydrocarbons other than isobutene.
5. A process as claimed in any of claims 1 to 3, wherein the stream further comprises halogenated hydrocarbons.
6. A process as claimed in any of the preceding claims, wherein the zeolite contains sodium ions and/or calcium ions to balance the charge.
7. A process as claimed in any of the preceding claims, wherein the zeolite is selected from among zeolite A, zeolite L, zeolite X and zeolite Y.
8. A process as claimed in any of the preceding claims, wherein the stream is dried prior to the zeolite treatment.
9. A process as claimed in any of the preceding claims, wherein the stream is passed through a fixed bed which comprises a zeolite having a mean pore size of from 0.3 to 0.4 nm upstream relative to the flow direction of the stream and a zeolite having a mean pore size of at least 0.5 nm downstream.
10. A process as claimed in any of the preceding claims, wherein the stream is used for preparing isobutene polymers.